WHAT IS CLAIMED IS:

1. A process for the direct production of desacetylcephalosporin C comprising culturing a strain of *Acremonium chrysogenum* containing nucleic acid encoding enzymes for cephalosporin C biosynthesis and a recombinant nucleic acid encoding *Rhodosporidium* cephalosporin esterase under conditions resulting in the synthesis of cephalosporin C and expression of cephalosporin esterase wherein the cephalosporin C so produced is converted to desacetylcephalosporin C.

2. The process of Claim 1 wherein the chemical breakdown of cephalosporin C to 2-(D-4-amino-4-carboxybutyl)-thiazole-4-carboxylic acid is less than 40%.

3. The process of Claim 1 wherein the chemical breakdown of cephalosporin C to 2-(D-4-amino-4-carboxybutyl)-thiazole-4-carboxylic acid is less than 30%.

4. The process of Claim 1 wherein the chemical breakdown of cephalosporin C to 2-(D-4-amino-4-carboxybutyl)-thiazole-4-carboxylic acid is less than 20%.

5. The process of Claim 1 wherein the chemical breakdown of cephalosporin C to 2-(D-4-amino-4-carboxybutyl)-thiazole-4-carboxylic acid is less than 10%.

6. The process of Claim 1 wherein the chemical breakdown of cephalosporin C to 2-(D-4-amino-4-carboxybutyl)-thiazole-4-carboxylic acid is less than 5%.

7. The method of Claim 1 carried out at a temperature of about 22°C to about 29 °C and a pH of about 5.5 to about 7.5.

8. The method of Claim 1 carried out at a temperature of about 25°C to about 29°C and a pH of about 6.2 to about 7.0, during the vegetative cell growth phase; at a temperature of about 22°C to about 26°C and a pH of about 5.7 to about 6.5 during the desacetylcephalosporin C production phase.

9. The method of Claim 1 wherein the recombinant nucleic acid encoding *Rhodosporidium* cephalosporin esterase is DNA.

10. The method of Claim 1 wherein the recombinant nucleic acid encoding *Rhodosporidium* cephalosporin esterase is DNA and part of a plasmid.

11. The method of Claim 10 wherein the recombinant nucleic acid encoding *Rhodosporidium* cephalosporin esterase has the sequence of SEQ.ID.NO.:1 or 3.

12. The method of Claim 10 wherein the plasmid is pSJC62.3.

13. The method of Claim 10 wherein the plasmid is pBMesterase11.